Organ and Tissue Donation and Transplantation in New Zealand Report 2006





Contents

Organ and tissue donation Number of organ donors by donor hospital and year Cause of donor death by year Age of organ donors by year Ethnicity of donors by year Organs and tissues retrieved for transplantation Organs from New Zealand donors transplanted in Australia Organs from Australian donors transplanted in New Zealand Tissue donation Organ Transplantation Kidney Heart and Lung Liver Pancreas	-2
Organ Donation New Zealand	3
Organ and tissue donation	8
Number of organ donors by donor hospital and year	8
Cause of donor death by year	9
Age of organ donors by year	9
Ethnicity of donors by year	9
Organs and tissues retrieved for transplantation	11
Organs from New Zealand donors transplanted in Australia	11
Organs from Australian donors transplanted in New Zealand	11
Tissue donation	12
Organ Transplantation	13
Kidney	13
Heart and Lung	14
Liver	15
Pancreas	15
Tissue transplantation	16
Corneas	16
Heart valves	16
Skin	16
References	17
Directory	18
Notes	19 – 24

Introduction

This report summarises organ and tissue donation from deceased donors and organ and tissue transplantation in New Zealand in 2006. This activity is compared to the previous four years and earlier data is in the 2005 report.

The report also contains a summary of the current and planned activity of Organ Donation New Zealand (ODNZ).

Acknowledgements

We would like to thank Dawn Kelly, Val Honeyman and Kerry-Lee Bruce of ODNZ who assisted in the preparation of this report. We gratefully acknowledge the contributions of Rosalie Gow from the Department of Molecular Medicine and Pathology, University of Auckland, Louise Moffatt from the New Zealand National Eye Bank, Jill Faulkner from the New Zealand Heart Valve Laboratory, Julie Hayman from the Tissue Bank at the New Zealand Blood Service, Dr John McCall for New Zealand Liver Transplant Unit data, Dr James Judson for data on brain death from the Department of Critical Care Medicine at Auckland City Hospital and Dr Toby Whitlock for actuarial survival statistics for heart and lung transplantation.

Stephen Streat FRACP Clinical Director, ODNZ

Janice Langlands Team leader, ODNZ

Janiu Langendo

Organ Donation New Zealand

There were no staffing changes at ODNZ during 2006. The service specification and the high-level service objectives are outlined in the 2005 report.

Activities of ODNZ during 2006

Coordinating organ and tissue donation from deceased-donors in NZ Intensive Care Units (ICUs)

The three donor co-ordinators for ODNZ provide a twenty-hour service for referrals from ICUs for organ donation, for tissue referrals and for livers referrals from Australia. Intensive care units are encouraged to consult with ODNZ early to determine suitability for donation and in 2006 there were 55 consultations.

Providing ongoing support for the families of these donors

The donor co-ordinators provide support and information for families following donation and for as many years as the family wishes following donation. It is more common now for recipients to write anonymous letters of thanks to the family of their donor. This communication is forwarded via the donor co-ordinator to the donor family, if they wish to receive it. In 2006, 67 recipients sent letters of thanks to their donor family. Communication from donor families to recipients is handled in the same way and in 2006, seven families sent correspondence to recipients.

ODNZ organises two Thanksgiving Services annually. These services respectfully acknowledge the generosity of families who have donated organs and tissues following the death of a family member. These services are attended by families of donors, recipients and their families and health professionals involved in both organ donation and transplantation. Services were held in Auckland and Wellington in 2006 with approximately 500 attendees at the service in Auckland and 300 at the Wellington service.

Tissue donation from donors who died in ICU but did not become brain dead

Val Honeyman, Donor Co-ordinator, has been working with the Department of Critical Care Medicine and the Cardio-Vascular Intensive Care Unit at Auckland City Hospital and the Intensive Care Unit at North Shore Hospital to develop processes so that families are offered the option of tissue (eyes and heart valves) donation following the death of a family member. Educational sessions on tissue donation have been held in these intensive care units and the majority of nursing staff have attended these sessions.

Development of a new programme for organ donation after cardiac death (DCD)

During early 2006 a working party of health professionals involved in organ donation, intensive care, transplantation and operating rooms developed a draft protocol for DCD after reference to international practice in DCD and in accord with New Zealand conditions. Formal consultation was then held with intensive care and operating room medical and nursing staff at Wellington Hospital, Christchurch Hospital and Auckland City Hospital. Dr William Hecker, transplant surgeon, Auckland City Hospital, and Dawn Kelly and Dr Stephen Streat from

Organ Donation New Zealand (CONTINUED)

ODNZ presented an advanced draft of the DCD protocol to these groups and invited comments. After further changes in the light of this consultation, Dr Streat presented the revised protocol and consulted members of the New Zealand Region of the Australian and New Zealand Intensive Care Society at a oneday meeting held in Wellington in November 2006. The Link Team members were also consulted (see below). A submission was then made to the Multi-Region Ethics Committee for review and ethical approval of the proposed protocol. Following discussion and a formal presentation to the Committee in Wellington in January 2007 by Dr Hecker, Dawn Kelly and Dr Streat, the Committee have set out further steps that ODNZ must take before formal approval is given. ODNZ is confident that these requirements can be met, is undertaking the necessary work and will then seek the formal approval of the Committee. Following such approval ODNZ plans to carry out an appropriate educational programme within hospitals who wish to participate in DCD and ensure that the appropriate processes are in place at each hospital before DCD begins there. It is expected that this opportunity will be taken up initially at a few large tertiary hospitals, where the majority of potential DCD donors are cared for. At the same time, ODNZ will release information publicly about DCD.

Providing hospital study days for staff involved in organ and tissue donation

During 2006 eight hospital study days (Auckland [2], Waikato, Dunedin, Rotorua, Christchurch, North Shore and Wellington) and two half-days (Blenheim, Middlemore) were provided by ODNZ.

These study days were well attended by nursing staff from intensive care units and operating theatres and other health professionals involved in the donation process.

The Australasian Donor Awareness Programme Training (ADAPT) programme

The ADAPT programmes provide health professionals with special training in organ donation processes, particularly recognising the needs of bereaved family members. During 2006 ODNZ provided four ADAPT Nursing Modules (Auckland, Wellington, Christchurch and Dunedin) and one Medical module (Auckland) for staff involved in organ and tissue donation. It was particularly gratifying to note that, for the first time in New Zealand, most of the participants in the Medical Module were advanced trainees in Intensive Care Medicine. The faculty involved in teaching this Module were particularly impressed with the qualities of these young doctors. This increase in participation results from the Medical ADAPT programme being now a mandatory requirement of the Joint Faculty of Intensive Care Medicine in Australia and New Zealand (following recommendation of Dr Streat in November 2004) and because the number of New Zealand (and Australian) doctors training in intensive care medicine has increased markedly in the last few years.

The Link programme

ODNZ continues to provide the Link Nurse programme (wherein every ICU in New Zealand has a senior intensive care nurse in a "Link" role with ODNZ) and is expanding this into a Link Team programme with the addition of Link Doctors and Operating Room (OR) Link Nurses. Link Doctors and OR

Link Nurses have been established in 22 of the 24 donor hospitals and it is expected that the remaining hospitals will nominate a Link Doctor and an OR Link Nurse during 2007.

ODNZ provided a two-day Link Team Workshop in Auckland in November 2006 which was attended by Link doctors and nurses from around the country. Topics discussed included: ODNZ and its strategic plan, the process of organ donation in New Zealand, tissue donation, the proposed ICU Death Audit, the draft protocol for Donation after Cardiac Death, the ANZICS guidelines for brain death and organ donation, the proposed legislative changes to the Human Tissue Act, brain injuries, brain death and the change in management of brain injuries, organ and tissue retrieval procedures and updates on heart, lung, liver and kidney transplantation in New Zealand from members of the appropriate transplant services. Pro and con debates were held on two topics - admission of critically ill patients to intensive care units solely for the purpose of organ donation and certification of brain death in circumstances where organ donation would not take place. Participants were provided with CD-ROMs containing all material presented at the workshop and this resource has gone to all the ICUs and Operating Rooms. The development of the Link Programme has been made possible by a generous financial grant from Janssen-Cilag Pty Ltd.

Assessment of local hospital "organ and tissue donation problem issues" and identifying and addressing local hospital organ and tissue donation needs

Following establishment of the Link Team in donor hospitals, Dr Stephen Streat and Janice Langlands have met with the Link Team at the hospital and conducted a structured interview with the Link Team members. This covers all aspects of the donation process and the team's assessment of the issues in their own hospital and how ODNZ can help. During 2006, 13 of the 24 hospitals were visited.

Development of an online prospective national audit of organ and tissue donation processes

A web-based audit tool has been developed by ODNZ and Enigma (an IT company) with substantial financial support from Roche Pharmaceuticals covering setup costs and the first three years of implementation. ODNZ plans to indefinitely audit all deaths in all (public hospital) New Zealand ICUs, to monitor the incidence of severe brain damage and of brain death, the potential for organ donation and the associated practices related to organ donation. The draft audit tool was completed in mid-2006 and tested by the Link Nurses at Waikato Hospital. Following further minor modifications it was presented to the Link Teams at the Link Workshop in November and tested by the ICU Link Nurses. A few further refinements were made. Approval was then sought from the Multiregion Ethics Committee in December and after some clarification of requirements, a full submission was made in January 2007. As a result of this the Committee has indicated a willingness to endorse the project, subject to some further conditions which ODNZ is currently seeking to fulfil. It is anticipated that Ethics approval will soon be obtained and that data collection can then commence. ICUs will come "on-line" to the project progressively in the months that follow. Data obtained from this will provide factual information about

Organ Donation New Zealand (CONTINUED)

many aspects of organ donation practices about which there is currently only speculation and opinion and will assist ODNZ to identify educational needs of various hospitals and then address those needs specifically.

Providing increased public access to information on organ and tissue donation.

ODNZ responds to public enquiries from the 24-hour 0800 number (08004DONOR) and the website www.donor.co.nz. ODNZ is now listed in all telephone directories in New Zealand. Pamphlets have been distributed to General Practitioners, Citizens Advice Bureaux and as requested. Transplant recipients have also assisted with the distribution of pamphlets in their communities.

Establishing the Advisory Committee of ODNZ

The Advisory Committee of ODNZ was constituted during 2006 and met in December. The Committee Membership is:

- Dr Peter Hicks (Chair), Medical Director Intensive Care Services, Wellington Hospital, Representative of New Zealand Region of Australia and New Zealand Intensive Care Society
- Mr Peter Alison, Surgical Director of New Zealand Heart and Lung Transplant Service
- Ms Elizabeth Campbell, Staff Nurse,
 Intensive Care Unit, Dunedin Hospital,
 Link Nurse Representative

- Ms Joanne Fitzpatrick,
 Consumer Representative
- Dr Bruce King, Specialist Physician in Internal Medicine – Intensive Care/ Nephrology, Nelson Hospital
- Professor Stephen Munn, Clinical Director, New Zealand Liver Transplant Unit and Auckland Renal Transplant Group
- Ms Georgina Parata,
 Consumer Representative
- Dr David Pendergrast, Clinical Director, New Zealand Eye Bank
- Assoc Professor Richard Robson,
 Nephrologist, Christchurch Hospital,
 Representative of Renal Transplant
 Sub-Committee
- Dr Jane Vuletic, Forensic Pathologist,
 Representative of Tissue Donation sector
- Maori Representative to be appointed
- Pacific Person Representative to be appointed

Providing advice to the Ministry of Health and to Government

ODNZ provided advice to the Ministry on Organ Donor Registries during 2006 and also made written and oral submissions to the Parliamentary Health Select Committee on the Human Tissue (Organ Donation) Amendment Bill (a Members Bill) and the Human Tissue (Government) Bill.

Attendance at Conferences and Training Workshops

- Donation after Cardiac Death
 Conference, London, United Kingdom
 Dawn Kelly attended this two-day
 conference prior to the development of
 the New Zealand protocol for DCD.
- Telephone Requesting Course, Liverpool, England
 Janice Langlands and Val Honeyman completed a two-day skills training course on approaching families for tissue donation. This workshop, facilitated by Margaret Verble and Judy Worth from USA, was attended by health professionals working in the tissue donation sector.
- Transplant Procurement Management
 Dr Stephen Streat attended this three-day
 workshop held in Sydney by Australians
 Donate. This workshop was a skills training
 workshop which included the identification
 of potential donors, physiological
 management of the donor and approaching
 families for organ donation.
- Australians Donate National Forum Janice Langlands attended this one-day forum held in Sydney in December. The forum reviewed the success of the Organ Transplant Breakthrough Collaborative commenced in the USA in 2004 and Canada and Australia in 2006.

Recent publications by ODNZ staff

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 (Eds) Sidebotham D, McKee A, Gillham M, Levy J. (Eds)Butterworth-Heinemann, 2007

Organ and tissue donation

During 2006 there were 25 deceased donors from ICUs in 13 donor hospitals who donated organs (and tissues) for transplantation. All donors were certified brain dead and the option of organ donation was offered to

families by intensive care staff. There were fewer donors in 2006 compared to previous recent years. There were no donations after cardiac death during 2006.

Table 1 - Number of Organ Donors by Donor Hospital and Year

Hospital	2002	2003	2004	2005	2006
DCCM, Auckland City*	12	8	5	6	4
Christchurch	1	5	4	3	3
Dunedin	0	5	6	3	2
Hawkes Bay	1	3	2	2	2
Hutt	1	1	0	0	1
Middlemore	3	1	2	1	3
Nelson	1	0	1	0	0
North Shore	0	1	1	0	0
Palmerston North	2	1	0	2	1
New Plymouth	0	0	3	1	0
Rotorua	2	1	1	0	0
Southland	1	4	1	1	0
Starship Children's	1	1	0	0	0
Tauranga	1	0	1	3	2
Timaru	1	0	0	0	1
Waikato	6	6	3	1	1
Wanganui	0	0	1	0	1
Wellington	5	2	9	5	3
Whakatane	0	1	0	0	0
Whangarei	0	0	0	1	1
Total	38	40	40	29	25

^{*}Formerly "Auckland Hospital"

Table 2 – Cause of Donor Death by Year

	2002	2003	2004	2005	2006
CVA	21	20	19	17	14
Trauma (road)	8	9	6	3	8
Trauma (other)	5	7	6	3	1
Other	4	4	4 9 6		2
Total	38	40	40	29	25

Table 3 – Age of Donors by Year

	2002	2003	2004	2005	2006
Mean	40.3	38.0	43.0	44.9	36.5
Median	42.6	39.7	46.1	48	35.4
Minimum	7.7	13	1.1	17	11.6
Maximum	66.7	75.1	78.2	64	69.4

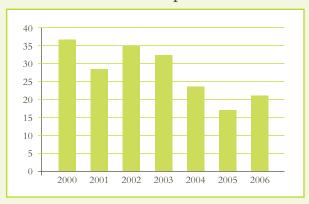
Table 4 – Ethnicity of Donors by Year

	2002	2003	2004	2005	2006
European	33	39	35	25	17
Maori	3	0	3	0	7
Pacific People	1	1	1	0	0
Other	1	0	1	4	1
Total	38	40	40	29	25

Organ and tissue donation (CONTINUED)

There has been a continuing fall in brain death in the Department of Critical Care Medicine (DCCM) at Auckland City Hospital where the number of patients becoming brain dead has fallen progressively since 2000 (see Figure below).

Number of brain dead patients - DCCM



Data from other hospitals is not yet available but will in future be collected and reported as part of the ICU Death Audit.

The underlying causes of this trend in brain death are likely to be multiple and may include primary prevention (e.g. in trauma) and advances in medical and surgical treatments of trauma and subarachnoid haemorrhage in particular. The evidence-based Guidelines for the Management of Severe Head Injury (Management and Prognosis of Severe Traumatic Brain Injury), first developed by the Brain Trauma Foundation in 1995 were updated in 2000 and 2003 and have recently been supplemented by separate

Guideline documents on Surgical Treatment¹ and on Paediatric patients². Intensivists and neurosurgeons in New Zealand are aware of these guidelines and have altered practice in accord with them in recent years. Conformance with these guidelines has been reported to be associated with both reductions in mortality and improvement in functional outcome in severe traumatic brain injury³.

Decompressive craniectomy is increasingly referred to in the Guidelines as a useful treatment option for intracranial hypertension and increasingly is being performed around the world. Decompressive craniectomy of Kjellberg type⁴ is now performed at all five New Zealand neurosurgical services (Auckland City Hospital, Waikato Hospital, Wellington Hospital, Christchurch Hospital and Dunedin Hospital). Two large multinational randomised controlled trials of decompressive craniectomy in trauma^{5,6} are currently in progress, one (the DECRA study) under the auspices of the Australian and New Zealand Intensive Care Society Clinical Trials Group and in which Auckland, Wellington and Christchurch are trial centres.

Interventional neuroradiology (including coiling of cerebral artery aneurysms in subarachnoid haemorrhage and intervention for vasospasm occurring after aneurysm exclusion) is now performed in Christchurch, Wellington and Auckland and will reportedly begin in Waikato Hospital during 2007.

Table 4 - Organs and Tissues retrieved for Transplantation

	2002	2003	2004	2005	2006
Kidneys*	70 (1)	74	65 (3)	55	42 (1)
Hearts	9	25	7 (1)	16	9
Lungs [‡]	12	22	12	11	13
Liver	28 (1)	34	35	22	24
Pancreas	2	6	2	2	6
Corneas [#]	29	35	32	11	9
Heart Valves [#]	20	9	21	6	7
Bone [#]	2	2	0	1	0

^{*} Single kidneys, ‡ number of lung recipients, () Organs not suitable for transplantation, # Number of donors of these tissues

Table 5 - Organs from New Zealand donors transplanted in Australia

	2002	2003	2004	2005	2006
Liver	5	5	6	4	8
Hearts	2	3	2	3	1
Lungs	4	9	3	2	3
Kidneys	0	0	1	4	0

Table 6 - Organs from Australian donors transplanted in New Zealand

	2002	2003	2004	2005	2006
Liver	11	8	7	6	12
Hearts	1	0	0	0	0
Lungs	0	0	0	0	0
Kidneys	0	0	0	0	0

Organ and tissue donation (CONTINUED)

Tissue donation

Tissues including eyes (for corneas and sclera), heart valves and skin are donated for transplantation by a number of deceased donors in various circumstances. The option of tissue donation is offered to families by the Donor Tissue Co-ordinators, Department of Molecular Medicine and Pathology, University of Auckland. These donors are having coroner's autopsies performed in Auckland and the tissues are removed during that process. Eye donation is offered to families by the staff of Bereavement Care at Middlemore Hospital in conjunction with the New Zealand National Eye Bank. Tissue donation is also offered by intensivists to families of organ donors. ODNZ has begun offering tissue donation to families of patients who have recently died in ICU. Tissue donation also occurs when dying patients or their families offer donation and this is coordinated by the New Zealand National Eye Bank for eye donation or ODNZ for multi-tissue donation. In addition, transplant recipients most commonly donate heart valves from their explanted hearts.

Organ Transplantation

Overview

Transplantation in New Zealand includes the following organs: kidney, heart, lung, liver and pancreas.

Kidney transplantation is provided at Auckland City Hospital (and Starship Childrens Hospital), Wellington Hospital and Christchurch Hospital. Heart, lung, liver and pancreas transplantation are provided at the Auckland City Hospital site (including paediatric heart, lung, liver, and kidney transplantation at Starship Children's Hospital). There are well established live-donor kidney transplantation programmes at all three centres, and live-donor adult-to-adult and adult-to-

child liver transplantation is also provided as part of the liver transplant programme.

Kidney transplantation

Kidney transplantation is performed at three centres – Auckland City Hospital (and Starship Children's Hospital), Wellington Hospital and Christchurch Hospital. All centres contribute data to the Australia and New Zealand Dialysis and Transplant Registry (see http://www. anzdata.org.au/). During 2006 there were 88 kidney transplants performed, including 41 where the kidney was from a deceased donor and 47 from a living donor.

Table 6 - Kidney transplantation by year and donor type

	2002	2003	2004	2005	2006
Recipients, deceased-donor, single kidney	69	66	54	47	41
Recipients, deceased-donor, double kidney		1	4	0	0
Living-donor	48	44	48	46	47
Total	117	111	106	93	88

Organ Transplantation (CONTINUED)

Heart transplantation and Lung transplantation

Heart transplantation in New Zealand commenced in December 1987 and lung transplantation commenced in 1993, both at Green Lane Hospital. These services have been provided at the Auckland City Hospital site since the end of 2003. The heart and lung transplant services contribute data to the Australia and New Zealand Cardiothoracic Organ Transplant Registry (which in turn contributes to the registry of the International Society for Heart and Lung Transplantation, which is available online at http://www.ishlt.org/registries/heartLungRegistry.asp).

There have been 192 heart transplants and 107 lung transplants performed in New Zealand up until the end of 2006, including nine heart transplants and 13 lung transplants in 2006. The New Zealand one-year, five-year and tenyear patient survival after heart transplantation is approximately 86%, 75% and 62% which are better than international outcomes as reported to the International Society for Heart and Lung Transplantation. The New Zealand one-year and five-year patient survival after lung transplantation is approximately 80% and 40% which are similar to international outcomes as reported to the International Society for Heart and Lung Transplantation.

Table 7 – Heart and Lung transplantation by year

	2002	2003	2004	2005	2006
Heart	7	22	4	13	8
Lung*	11	14	7	8	13

^{*}Lung recipients

Liver transplantation

Liver transplantation in New Zealand commenced in February 1998, initially with adult recipients, and in 2002 liver transplantation was extended to children. These services are provided at the Auckland City Hospital site, including Starship Children's Hospital. The New Zealand Liver Transplant Unit (NZLTU) contributes data to the Australia and New Zealand Liver Transplant Registry (http://www.cs.nsw.gov.au/Gastro/LiverTransplant/default.htm).

There have been 285 liver transplants (on 274 recipients) performed in New Zealand up until the end of 2006, including 256 transplants in 246 adult recipients and 29 transplants in

28 children. Ten of these transplants were from live donors (three adult recipients, seven children). During 2006 three adults received the right lobe of a split liver from a deceased donor. The New Zealand one-year and five-year patient survival after liver transplantation is approximately 95% and 87%, somewhat above most internationally reported outcomes.

Pancreas transplantation

Pancreas transplantation in New Zealand commenced in 1998 – as "simultaneous-pancreas-kidney" (SPK) transplantation for insulin-dependent diabetics with end-stage renal failure. This service is provided at the Auckland City Hospital.

Table 8 – Liver transplantation by year

	2002	2003	2004	2005	2006
Adult, deceased donor	31	32	33	21	27
Adult, live adult donor	1	0	0	0	2
Child, deceased donor	6	5	3	3	5
Child, live adult donor	0	1	0	4	2
Total	38	38	36	28	36

Table 9 – Pancreas transplantation by year

	2002	2003	2004	2005	2006
Pancreas	2	6	2	2	6

Tissue Transplantation

Overview

Tissue transplantation in New Zealand includes eyes (corneas and scleras), heart valves, skin and bone. Corneal tissue is stored for up to 21 days at the New Zealand National Eye Bank, at the Faculty of Medical and Health Sciences, University of Auckland. Corneal transplantation takes place in 13 centres throughout New Zealand, most commonly for keratoconus.

Heart valves are stored for up to five years at the New Zealand Heart Valve Laboratory, Starship Children's Hospital, and are transplanted (into both adults and children) at Auckland City Hospital, Starship Children's Hospital, Mercy Hospital and Ascot Hospital.

Skin is stored for up to five years at the Tissue Bank at the New Zealand Blood Service (71 Great South Road, Epsom) and it is subsequently used as a "temporary dressing" to cover large wounds, most commonly debrided burn wounds.

Corneal Transplantation

The New Zealand National Eye Bank (NZNEB) was established in 1987, is located within the Department of Ophthalmology of the Faculty of Medical and Health Sciences, University of Auckland, and provides all of the donated ocular tissue for transplantation in New Zealand.

During 2006 the NZNEB procured ocular tissue from 139 donors, including 48 donors from the Auckland Coroners service, 76 from public hospitals, nine from organ donors and six from private hospitals or directly from the community. A total of 276 donor corneas were received during 2006, 246 of which

were transplanted and 30 of which were unsuitable for transplantation. In addition, 187 donor sclera were transplanted for surgical reconstruction following ocular trauma or tumour removal.

Heart Valve Transplantation

Homograft valve replacements are performed at Auckland City Hospital and Starship Children's Hospital and some also take place at two private hospitals in Auckland (Mercy Hospital and Ascot Hospital). Aortic and pulmonary valves are retrieved for transplantation into children and adults, most commonly in the aortic position.

During 2006 heart valves were retrieved from 35 donors, including 20 donors who had undergone Coronial autopsy at the Auckland Coroners service, seven organ donors, four tissue-only donors facilitated by ODNZ and four heart transplant recipients. Approximately 15% of retrieved valves are unsuitable for transplantation for various reasons.

Skin Transplantation

Skin is stored for up to five years at the "Tissue Bank" at the New Zealand Blood Service and is transplanted at Middlemore and Waikato Hospitals, largely as a "temporary dressing" (lasting some weeks) to cover large areas of debrided burns, and occasionally for other indications (necrotising fasciitis, meningococcal sepsis). Such a skin cover reduces many of the life-threatening complications of these wounds (e.g. fluid loss, heat loss, infections and breakdown of other tissues). Skin was donated from 14 donors in 2006.

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